MP MASTER
MA34063

REF.	DESCRIPTION	KRUSE P/N	MFR	MFR P/N
570-15002A2R10	RESISTOR, Metal Film, 910Ω ±2% 1/4W	471431	Corning	CL4
570-15002A2R11	RESISTOR, Metal Film, 910Ω ±2%, 1/4W	471455	Corning	CL4
570-15002A2R12	RESISTOR, Metal Film, 19KΩ ±2%, 1/4W,	471456	Corning	CL4
570-15002A2R13	RESISTOR, Metal Film, 100KΩ ±2%, 1/4W	471480	Corning	CL4
570-15002A2R14	RESISTOR, Metal Film, 100KΩ ±2%, 1/4W	471480	Corning	CL4
570-15002A2R15	Jumper			
570-15002A2R16	RESISTOR, Metal Film, 200KΩ ±2%, 1/2W	472240	Corning	CL5
570-15002A2R17	RESISTOR, Metal Film, 150Ω ±2%, 1/4W	471436	Corning	CL4
570-15002A2R18	RESISTOR, Metal Film, 1800Ω±2%, 1/4W	471438	Corning	CL4
470-15002A2R19	RESISTOR, Metal Film, 100KΩ ±2%, 1/4W,	471480	Corning	CL4
570-15002A2R20	RESISTOR, Metal Film, 390Ω±2%, 1/4W	471422	Corning	CL4
570-15002A2R21	RESISTOR, Metal Film, 56KΩ ±2%, 1/4W	471474	Corning	CL4
570-15002A2R22	NOT USED			
570-15002A2R23	RESISTOR, Metal Film, 4700Ω ±2%, 1/4W	471448	Corning	CL4
570-15002A2R24	RESISTOR, Metal Film, 27KΩ ±2%, 1/4W	471466	Corning	CL4
570-15002A2R25	RESISTOR, Metal Film, 15KΩ ±2%, 1/4W	471460	Corning	CL4
570-15002A2R26	RESISTOR, Metal Film, 470Ω ±2%, 1/4W	471424	Corning	CL4
570-15002A2R27	RESISTOR, Value Selected at Test			
570-15002A2R28	NOT USED			
570-15002A2R29	RESISTOR, Metal Film, 5100Ω ± 2%, 1/4W	471449	Corning	CL4
570-15002A2R30	RESISTOR, Metal Film, 10KΩ ±2%, 1/4W	471456	Corning	CL4
570-15002A2R31	NOT USED			
570-15002A2R32	RESISTOR, Metal Film, 4700Ω ±2%, 1/4W	471448	Corning	CL4
570-15002A2R33	RESISTOR, Value determined at test			
570-15002A2R34	NOT USED			
570-15002A2R35	RESISTOR, Wirewound, 300Ω ±5%, 3W	477036	Ward-Leonard	3X220
570-15002A2R36	RESISTOR, Value determined at test			
570-15002A2S1-S3	SWITCH ASSEMBLY, Interlocked, 3X DPDT		IEE/Schadow	3XF12.5 (std) FU12/Blk 2 UGR

A2 P. C. ASSEMBLY ELECTRONIC PARTS LIST

REF. DESIG.	DESCRIPTION	KRUSE P/N	MFR	MFR P/N
570-15002A2C1	CAPACITOR Ceramic, .01μF, ±20%, 100V	150100	Sprague	TGS10
570-15002A2C2	CAPACITOR, Mica, 10pF ±10%, 500V	155462	Elmenco	DM 15-100J
570-15002A2C3	CAPACITOR, Ceramic, .01μF, ±20%, 100V	150100	Sprague	TGS10
570-15002A2C4	CAPACITOR, Mica, 22pF ±10%, 500V	155467	Elmenco	DM-15-220J
570-15002A2C5	CAPACITOR, Value Selected at Test			
570-15002A2C6	CAPACITOR, Mica, 5pF ±10%, 500V	155460	Elmenco	DM15-050K
570-15002A2C7	CAPACITOR, Ceramic, .01μF ±20%, 100V	150100	Sprague	TGS10
570-15002A2C8	CAPACITOR, Ceramic, .01μF ±20%, 100V	150100	Sprague	TGs10
570-15002A2C9	CAPACITOR, Mica, 27pF ±10%, 500V,	155470	Elmenco	DM15-270J
570-15002A2C10	CAPACITOR, Ceramic, .01μF ±20%, 100V	150100	Sprague	TGS10
570-15002A2C11	CAPACITOR, Electrolytic, 50μF, 50V.(85° C)	152410	Sprague	TE1307
570-15002A2CR1	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A2CR2	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A2CR3	DIODE, Zener, 5.6V, IN5232	480041	Motorola	IN5232
570-15002A2CR4	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A2CR5	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A2CR6	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A2CR7	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A2CR8	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A2CR9	DIODE, Silicon, IN4005	480003	Dickson	IN4005
570-15002A2IC1	INTEGRATED CIRCUIT, Operational Amplifier	480655	Natl Semi	LM301A
570-15002A2IC2	INTEGRATED CIRCUIT, Operational Amplifier	480655	Natl Semi	LM301A
570-15002A2IC3	INTEGRATED CIRCUIT, Operational Amplifier	480655	Natl Semi	LM301A
570-15002A2J1	CONNECTOR, Receptacle, 30 pin female		Masterite Industries	DS014AL15-DR-H-AY
570-15002A2Q1	TRANSISTOR NPN Silicon,	485004	RCA	2N2102
570-15002A2R1	RESISTOR, Value Selected at Test			
570-15002A2R2	RESISTOR, Metal Film, 82KΩ ±2%, 1/4W	471478	Corning	CL4
570-15002A2R3	RESISTOR, Metal Film, 1000Ω ±2%, 1/4W	471432	Corning	CL4
570-15002A2R4	RESISTOR, Metal Film, 100KΩ ±2%, 1/4W	471480	Corning	CL4
570-15002A2R5	RESISTOR, Metal Film, 100KΩ ±2%, 1/4W	471480	Corning	CL4
570-15002A2R6	RESISTOR, Metal Film, 100KΩ ±2%, 1/4W	471480	Corning	CL4
570-15002A2R7	RESISTOR, Metal Film, 5100Ω ±2%, 1/4W	471449	Corning	CL4
570-15002A2R8	RESISTOR, Metal Film, 10KΩ ±2%, 1/4W,	471456	Corning	CL4
570-15002A2R9	RESISTOR, Metal Film, 10KΩ ±2%, 1/4W	471456	Corning	CL4

A2 P. C. ASSEMBLY ELECTRONIC PARTS LIST

REF. DESIG.	DESCRIPTION	KRUSE P/N	MFR.	MFR P/N
570-15002A1R32	RESISTOR, Variable, 1000Ω, (F-Start)	479508	Allen-Bradley	ZH1021-1K
570-15002A1R33	RESISTOR, Value, determined at Test			
570-15002A1R34	RESISTOR, Metal Film, 1800Ω ±2%, 1/4W	471438	Corning	CL4
570-15002A1R35	RESISTOR, Metal Film, 10Ω ±2%, 1/4W	471456	Corning	CL4
570-15002A1R36	RESISTOR, Metal Film, 20 KΩ ±2%, 1/4W	471463	Corning	CL4
570-15002A1R37	RESISTOR, Value Determined at Test			
570-15002A1R38	RESISTOR, Metal Film, 750Ω ±2%, 1/4W	71429	Corning	CL4
570-15002A1R39	RESISTOR, Value determined at Test			
570-15002A1R40	RESISTOR, Metal Film, 20KΩ ±2%, 1/4W	471463	Corning	CL4
570-15002A1R41	RESISTOR, Metal Film, 1000Ω, ±2%, 1/4W	471432	Corning	CL4
570-15002A1X	P. C. BOARD ONLY	936242	Kruse	936242

A1 P. C. BOARD ASSEMBLY ELECTRONIC PARTS LIST

REF. DESIG.	DESCRIPTION	KRUSE P/N	MFR.	MFR. P/N
570-15002A1Q1	TRANSISTOR, NPN Silicon, 2N3391	485006	GE	2N3391
570-15002A1Q2	TRANSISTOR, PNP Silicon, 2N4314	485029	RCA	2N4314
570-15002A1Q3	TRANSISTOR, PNP Silicon, 2N5193	485055	Motorola	2N5193
570-15002A1Q4	TRANSISTOR, PNP Silicon, 2N5193	485055	Motorola	2N5193
570-15002A1Q5	RECTIFIER, Silicon-controlled, 50V, 1.6A	485015	Unitrode	ID200
570-15002A1R1	RESISTOR, Metal Film, 5100 ±2%, 1/4W	471449	Corning	CL4
570-15002A1R2	RESISTOR, Metal Film, 51KΩ, ±2%, 1/4W	471473	Corning	CL4
570-15002A1R3	RESISTOR, Metal Film, 51KΩ, ±2%, 1/4W	471473	Corning	CL4
570-15002A1R4	RESISTOR, Metal Film, 51KΩ, ±2%, 1/4W	471473	Corning	CL4
570-15002A1R5	RESISTOR, Metal Film, 51KΩ, ±2%, 1/4W	471473	Corning	CL4
570-15002A1R6	RESISTOR, Metal Film, 51KΩ, ±2%, 1/4W	471473	Corning	CL4
570-15002A1R7	RESISTOR, Wirewound, 100Ω, ±5%, 3W	477030		
570-15002A1R8	RESISTOR, Carbon, 1MΩ, ±10%, 1/4W	475678		
570-15002A1R9	RESISTOR, Variable, 10KΩ (F-Stop)	479518	Allen-Bradley	ZH1031-10K
570-15002A1R10	RESISTOR, Value Determined at Test			
570-15002A1R11	RESISTOR Metal Film, 150KΩ, ±2%, 1/4W	471484	Corning	CL4
570-15002A1R12	RESISTOR, Metal Film, 100KΩ, ±2%, 1/4W	471480	Corning	CL4
570-15002A1R13	RESISTOR, Carbon, 2.2MΩ, ±10%, 1/4W	475680		
570-15002A1R14	RESISTOR, Metal Film, 15KΩ, ±2%, 1/4W	471460	Corning	CL4
570-15002A1R15	RESISTOR, Carbon, 220KΩ, ±10%, 1/4W	475652		
570-15002A1R16	RESISTOR, Carbon, 2.2MΩ, ±10%, 1/4W	475680		
570-15002A1R17	RESISTOR, Metal Film, 24 KΩ, ±2%, 1/4W	471465	Corning	CL4
570-15002A1R18	RESISTOR, Metal Film, 10 KΩ, ±2%, 1/4W	471456	Corning	CL4
570-15002A1R19	RESISTOR, Metal Film, 5100Ω ±2%, 1/4W	471449	Corning	CL4
570-15002A1R20	RESISTOR, Metal Film, 5100Ω ±2%, 1/4W	471449	Corning	CL4
570-15002A1R21	RESISTOR, Carbon, 1MΩ ±10%, 1/4W	475678		
570-15002A1R22	RESISTOR, Metal Film, 20KΩ ±2%, 1/4W	471463	Corning	CL4
570-15002A1R23	RESISTOR, Calue Determined at Test			
570-15002A1R24	RESISTOR, Metal Film, 20KΩ, ±2%, 1/4W	471463	Corning	CL4
570-15002A1R25	RESISTOR, Variable, 1000Ω (F-Max)	479508	Allen-Bradley	ZH1021-1K
570-1500aA1R26	RESISTOR, Metal Film, 8200Ω ±2%, 1/4W	471454	Corning	CL4
570-15002A1R27	RESISTOR, Metal Film, 470Ω ±2%, 1/4W	471424	Corning	CL4
510-15002A1R28	RESISTOR, Metal Film, 1000Ω ±2%, 1/4W	471432	Corning	CL4
510-15002A1R29	RESISTOR, Wirewound, 2Ω ±3%, 3W	477021	Corning	CL4
510-15002A1R30	RESISTOR, Metal Film, 24KΩ, ±2%, 1/4W	471465	Corning	CL4
510-15002A1R31	RESISTOR, Value Determined at test			

A1 P. C. BOARD ASSEMBLY ELECTRONIC PARTS LIST

REF. DESIG.	DESCRIPTION	KRUSE P/N	MFR.	MFR. P/N
570-15002A1C1	CAPACITOR, Monolythic, 0.1μF, 100V	150920	Erie	8133-000-W5RO-104K
570-15002A1C2	CAPACITOR, Mica, 33pF, ±5%, 500V	155472	Elmenco	DM15-330J
570-15002A1C3	CAPACITOR, Tantalum, 22μF, 25V	154003	Sprague	196D226X0030FB
570-15002A1C4	CAPACITOR, Monolythic, 0.1μF,100V	150920	Erie	8133-000-W5RO-104K
570-15002A1C5	CAPACITOR, Mica, 100pF, ±5%, 500V	155490	Elmenco	DM15-101J
570-15002A1C6	CAPACITOR, Ceramic, .005μF ±20%, 100V	150010	Sprague	TG-D-50
570-15002A1C7	CAPACITOR, Monolythic, 0.1μF, 100V	150920	Erie	8133-000-W5R0-104K
570-15002A1 C8	CAPACITOR, Mica, 33pF ±5%, 500V	155472	Elmenco	DM15-330J
570-15002A1C9	CAPACITOR, Monolythic, 0.1μF, 100V	150920	Erie	8133-000-W5RO-104K
570-15002A1C10	CAPACITOR, Mica, 33pF ±5%, 500V	155472	Elmenco	DM15-330J
570-15002A1C11	CAPACITOR, Monolythic, 0.1μF, 100V	150920	Erie	8133-000-W5RO-104K
570-15002A1C12	CAPACITOR, Mica, 33pF ±5%, 500V	155472	Elmenco	DM15-330J
570-15002A1C13	CAPACITOR, Tantalum, 22μF, 25V	154003	Sprague	196D226X0020FB
570-15002A1CR1	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A1CR2	DIODE, Zener, 5.6V, IN5232	480041	Motorola	IN5232
570-15002A1CR3	DIODE, Silicon, IN4005	480003	Dickson	IN4005
570-15002A1CR4	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A1CR5	DIODE, Zener, 5.6V, IN5232	480041	Motorola	IN5232
570-15002A1CR6	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A1CR7	DIODE, Silicon, IN4446	480004	Fairchild	IN4446
570-15002A1CR8	DIODE, Zener, 6.2V, IN827	480011	Int. Resistance Corp.	IN 827
570-15002A1CR9	DIODE, Silicon, IN4005	480003	Dickson	IN4005
570-15002A1CR10	DIODE, Zener, Voltage Selected at Test	------	---------	---------

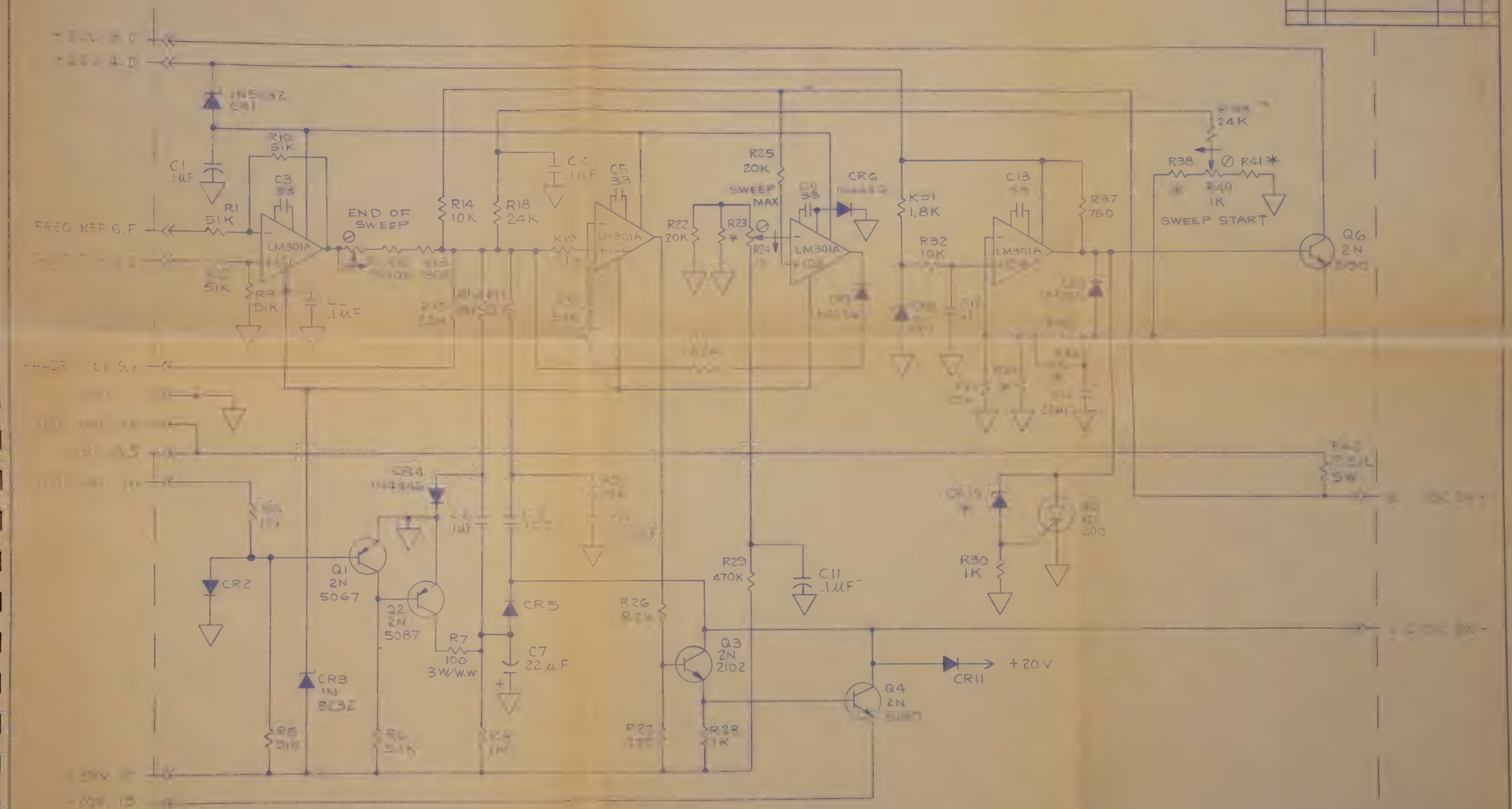
570-15002
A1 P.C. BOARD ASSEMBLY ELECTRONIC
PARTS LIST

MODEL 570-15200 RF PLUG-IN

CHASSIS ELECTRONIC PARTS LIST

REFERENCE	DESCRIPTION	KRUSE P/N	MFR.	MFR. P/N
570-15002A1	P.C. BOARD ASSEMBLY, Oscillator Driver	950501	Kruse	950501
570-15002A2	P.C. BOARD ASSEMBLY, Amplitude Modln	950550	Kruse	950550
570-15200A3	OSCILLATOR ASSEMBLY, 7 - 11 GHz	110103	Varian	VSX9071CE
570-15200A4	CIRCULATOR ASSEMBLY	110009	Amlabs	VL 1052
570-15200A5	MODULATOR ASSEMBLY	345007	Microwave Associates	MA 8304-123S
	MODULATOR ASSEMBLY (Alternate)	345007	Crown Microwave	CS 1033
570-15200A6	DIRECTIONAL COUPLER ASSEMBLY, 10 dB	N/A	Narda	4015C-10
570-15200A7	VIDEO DETECTOR ASSEMBLY	110304	Hewlett-Packard	8472A
570-15200DS1	INDICATOR, Light Emitting Diode, Red	390005	Monsanto	MV-5022
570-15200J1	ADAPTER, Bulkhead Mounting, type N receptacle to SMA plug	9132	Kruse	9132
570-15200J2	CONNECTOR, Receptacle, BNC (Insulated)	210157	Kings	KC 79-67
570-15200J3	CONNECTOR, Receptacle, BNC (UG-1094/U)	210011	Amphenol	31-221-1050
570-15200P20	CONNECTOR, Plug, 32 pin male	210213	Amphenol	26-159-32
570-15200R1	RESISTOR, Variable, 10 kΩ ± 10%	479520	Allen-Bradley	WA1GO40P103UA
570-15200S1	SWITCH, Slide, DPDT	510023	Stackpole	SS-50

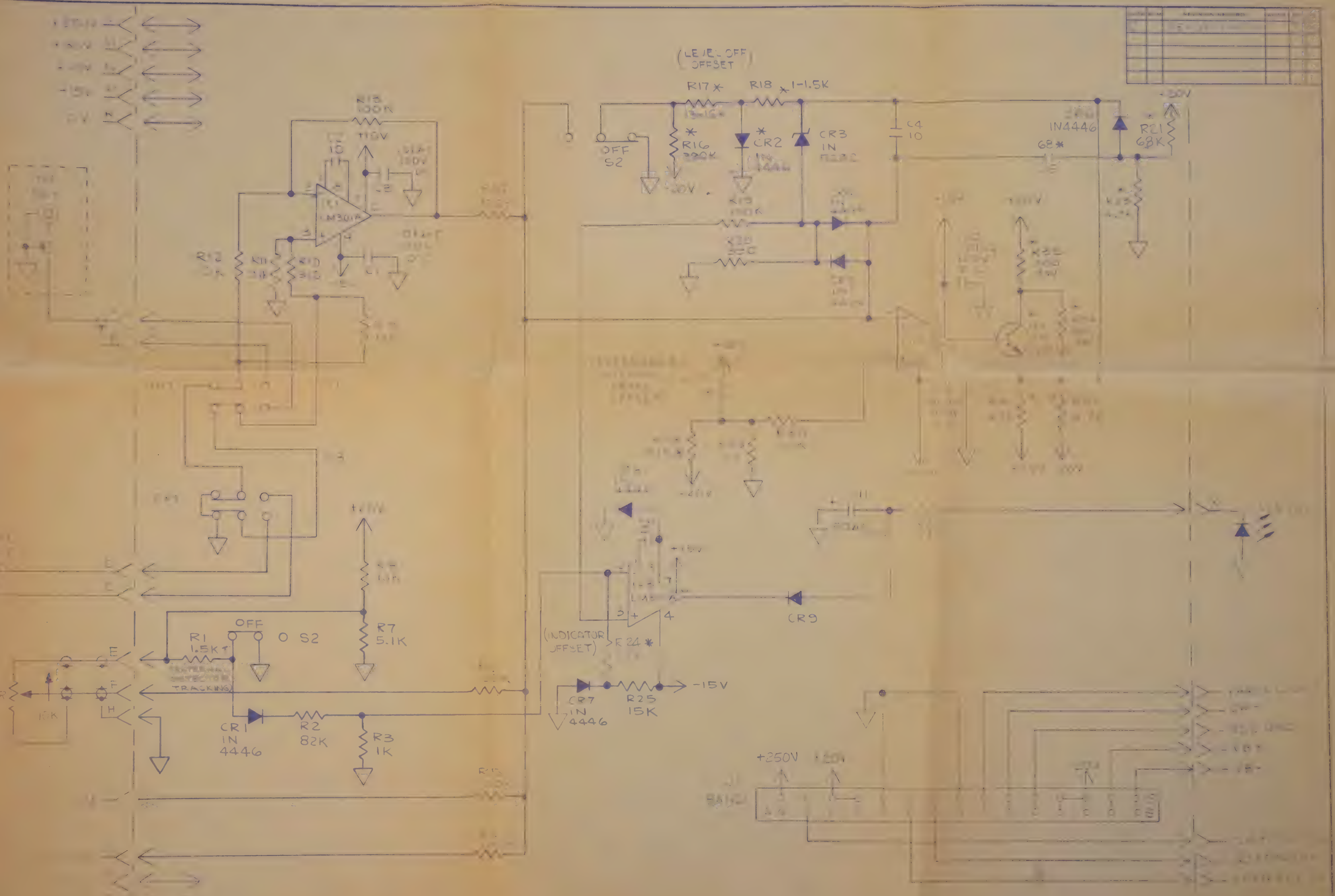
DATE	SYM	REVISION RECORD	AUTH	DR	CK



RANGE	ASSY	R11	R13	R16	R17	R18	R19	R20
C	350565	1K Ω	249 Ω	249 Ω	5.62K Ω	1.00K Ω	1.00K Ω	0.5Ω 1/4W
X	350562	249 Ω	49.9Ω	51Ω	10.0Ω 1/2W	350Ω	51Ω	0.5Ω 1/4W
KU	350502	51Ω	10Ω	10Ω	2.49Ω 1/2W	1.00Ω	249Ω	0.5Ω 1/4W

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. ALL CAPACITORS IN PICOFARADS 50(V) MICA
   B. ALL RESISTORS IN OHMS, 1/4 W 2% METAL FILM, 200PPM
   C. ALL POTENTIOMETER ARROWS INDICATE CW ROTATION
   D. * INDICATES [illegible] AT TEST
   E. [illegible] SEE TABLE FOR [illegible]

TOLERANCES (EXCEPT AS NOTED)			
DECIMAL ±	57E SERIES	SCALE NONE	DRAWN BY [illegible]
			APPROVED BY
FRACTIONAL ±	TITLE SCHEMATIC DIAGRAM YIG DRIVER FOR VARIAN [illegible]		
ANGULAR ±	DATE 2-8-1973	DRAWING NUMBER [illegible]	


(LEVEL OFF SET)
R17 *
R18 * 1-1.5K
R16 *
CR2
CR3 IN
C4 10
OFF S2
-30V
IN4446
68 *
+30V
R21 68K
R15 100K
110V
C2
C1
LM301A
R12
R11
R10
R13 100K
R20 300
+15V
R7 5.1K
R1 1.5K
OFF
S2
TRACKING
CR1 IN 4446
R2 82K
R3 1K
(INDICATOR OFFSET)
R24 *
CR9
CR7 IN 4446
R25 15K
-15V
+250V
+150V
BATT
NOTES:
1. UNLESS OTHERWISE SPECIFIED:
A. ALL CAPACITORS IN PICOFARADS 500V MICA
B. ALL RESISTORS IN OHMS, 1/4W 2% METAL FILM
C. ALL POTENTIOMETER ARROWS INDICATE CW ROTATION
D. * INDICATES VALUE SELECTED AT TEST
E. S2 (OFF) BUTTON DEPRESSED
TOLERANCES
570
SCHEMATIC DIAGRAM
MOTHERBOARD

SECTION 6

DRAWINGS AND PARTS LISTS

6.1 SCHEMATIC DIAGRAMS

The following schematic diagrams, applicable to the 570-15200, are included in this section:

Single AM Mother Board Schematic	Dwg. No. 900419
YIG Driver for Varian Oscillators Schematic	Dwg. No. 900420

6.2 PARTS LISTS

The parts lists applicable to the 570-15200 are included following the schematic diagrams.

SECTION 5

MAINTENANCE

5.1 ROUTINE MAINTENANCE

The 570 does not require routine maintenance or calibration; it should of course be kept free of dust and dirt, but no regularly-scheduled maintenance is necessary. Clean the filter and vacuum out the cooling air channel as required.

5.2 CORRECTIVE MAINTENANCE

5.2.1 General. Field repair of the RF plug-in is not recommended. The oscillator, heart of the plug-in, is not a field-repairable item. Replacement oscillators can be supplied for replacement in the field, but the following facts should be kept in mind:

- Many oscillators can be repaired at the factory, at far lower cost than that of a new oscillator.
- Even after an oscillator has been replaced, the plug-in unit will still have to be calibrated by the selection of precision fixed components. This is a job best done at the factory.
- The plug-in unit and oscillators are covered by a one or two-year warranty; refer to the front of this manual. Attempted repair may void this warranty.

5.2.2 Trouble Isolation. If the 570 is to be repaired in the field, it is necessary that a Model 593 plug-in extender be available. Access to the unit is otherwise severely limited.

WARNING

PIN 18 OF THE INTERFACE CONNECTOR CARRIES LETHAL VOLTAGE.

Standard troubleshooting techniques should be used to locate defective components.

In addition to the leveling voltage to the summing junction of amplifier A1IC2, three other amplitude control voltages are fed through A1R6, A1R4, and A1R5. These are power control from R1, external amplitude modulation from the EXT AM connector on the rear panel of the 540, and internal modulation from the AM board. The 540 generates a 1 kHz modulation signal as well as a control voltage to turn the modulator completely off when the 540 RF OFF pushbutton has been depressed. These three signals, plus the leveling signal from A1IC1, comprise the total of the inputs to the summing junction of operational amplifier A1IC2.

4.2.4 Modulator Driver Circuit. Positive drive will increase the conductivity of the PIN diodes in the modulator, and increase the RF attenuation of the modulator for which drive is provided.

The output of AM amplifier A1IC2 is fed through emitter follower A1Q1 to the PIN diode driver circuit, and is used to increase the positive drive (RF attenuation) as determined by the leveling and AM drives to A1IC2.

4.2.5 UNLEVELED Indicator. Operational amplifier A1IC3 monitors the differential voltage between the A1CR4/A1CR5 junction and a reference voltage at the A1R2/A1R3 junction; when this voltage exceeds a predetermined value, the output of comparator A1IC3 illuminates light-emitting diode (LED) DS1. DS1 is always lighted when the LEVELING OFF pushbutton has been depressed.

SECTION 4

THEORY OF OPERATION

4.1 GENERAL

The descriptions in this section of the 570 circuitry are based upon the schematic diagrams in Section 6.

4.2 CIRCUIT DESCRIPTIONS

4.2.1 Oscillator. The oscillator is a sealed assembly, containing a Gunn diode RF source and a YIG (Yttrium-Iron-Garnet) filter; the filter is tuned by the sweep signal from the 540, which has been processed by one of the YIG driver boards.

The operating point of the broadband Gunn diode source is determined by the bias voltage (VB+ and VB-) from the YIG driver; the exact frequency of the oscillator is determined by the current through the tuning coil of the YIG material (SW+ and SW-).

A ferrite isolator is used between the output of the oscillator and the PIN diode modulator; this isolator protects the oscillator from damage which might be caused by operating into a mismatched load, and reduces the effect a mismatch might have upon oscillator frequency. At the same time, it presents a constant source impedance to the modulator, allowing it to operate more predictably.

4.2.2 YIG Driver. The YIG driver board converts the linear 0 V to -10 V sweep, or the 0 to -10 VDC level in CW or manual scan from the 540 mainframe to a sweep signal or voltage which matches the non-linear characteristics of the YIG tuning coil in the oscillator. The YIG driver board also accepts an FM input (when the WIDE/NARROW switch is set to WIDE) for frequency locking or FM'ing the oscillator. Adjustments for setting starting, stopping, and maximum frequency limits are on the YIG driver board.

4.2.3 Leveling and Amplitude Modulation Circuits. The leveling circuits comprise switches A1S1 through A1S3, operational amplifiers A1IC1 and A1IC2, and transistor A1Q1 on the mother board.

The output of an internal leveling detector (Option M2 only) is selected when the LEVELING INT pushbutton has been depressed; amplifier A1IC1 increases the level of this signal and couples it through resistor A1R14 to the summing junction of operational amplifier A1IC2.

Amplifier A1IC1 is also used as a preamplifier when the LEVELING EXT pushbutton is depressed; the output of an external leveling detector is fed through front-panel connector J2, amplified by A1IC1, and fed through A1R14 to the summing junction of A1IC2.

3.2 OPERATING NOTES

3.2.1 Internal Modulator. The 540 internal 1 kHz modulator drives the 570-15200 modulator with a square wave, reducing the RF output of the plug-in on positive 1 kHz peaks. Most VSWR amplifiers and ratiometers will respond to the demodulated 1 kHz signal. If one of these units is being used, the 1 KHZ ADJ control on the rear panel of the 540 should be tuned for maximum response of the meter in use before measurements are made. Tuning the plug-in modulating frequency to that of the VSWR amplifier will considerably increase the measurement accuracy and signal-to-noise ratio.

3.2.2 Leveling. Leveling is the process which overcomes the natural tendency of RF sources to generate different power levels at different frequencies due to resonances, losses, and other frequency-sensitive factors. The desired end result for the 570-15200 RF plug-in is for the power level generated at all frequencies to be identical. When a plug-in is leveled internally, the power level at the RF OUT connector is essentially flat over the specified frequency range.

To be most useful, leveling should be accomplished as closely as possible to the point of measurement; external leveling is most desirable above 500 MHz or so due to the effects of standing waves in the coaxial cables and frequency sensitivities in other coaxial components in a given test setup. When external leveling is used, the power level at the output of the leveler is essentially identical for all output frequencies.

3.2.3 FM Inputs. The 570 may be frequency modulated in two ways: when the rear-panel WIDE/NARROW switch is set to NARROW, FM INPUT connector J3 feeds the fast FM coil of the selected oscillator directly. A current driver is required; maximum current is + or - 75 mA. The sensitivity varies with oscillator frequency.

When the switch is set to WIDE, J3 feeds the YIG (oscillator) driver boards rather than feeding the oscillator directly. A voltage source is required; sensitivity is a constant 10 MHz/volt at any frequency.

The output of a discriminator is often used to lock the output frequency of the 570 oscillator to an external standard; AC-coupled audio-frequency outputs are often used when it is desirable to generate a swept or non-swept FM signal.

Table 3.1 Model 570-15200 Controls, Indicators, and Connectors (Continued)

FIG. 3.1 INDEX	ITEM	FUNCTION
6 (Cont.)	LEVELING Switches (Cont.)	
	OFF Position	The RF output is unleveled, but the RF LEVEL control may be used for control. Maximum peak power output is available in this position.
	EXT Position	All plug-ins may be externally leveled using an appropriate leveler. In this position, an external negative voltage at the LEVELER EXT DET connector is used to control the RF output over the frequency range of the plug-in.
7	FM INPUT Connector	BNC connector. A phase lock signal for frequency control or FM'ing may be fed in at this point.
8	Interface Connector	Rear Panel 32 pin connector. Mates to connector in 540 plug-in compartment, allowing operating and signal voltages to be passed between the units.
9	FM INPUT NARROW/WIDE Switch	Slide switch. Selects mode of phase locking or FM'ing the selected oscillator:
	NARROW Position	The FM input from J4 is connected directly to the fast FM coil in the oscillator module; frequency response is narrow.
	WIDE Position	The input from J4 is connected to the oscillator driver board; sensitivity is 10 MHz/V.

Table 3.1 Model 570-15200 Controls, Indicators, and Connectors

FIG. 3.1 INDEX	ITEM	FUNCTION
1	RF LEVEL Control	Black knob/potentiometer. Controls the RF output amplitude of the plug-in; when the plug-in is internally or externally leveled, the dial graduations read directly in milliwatts. This control has a range of ≈40 dB.
2	UNLEVELED Indicator.	Red light-emitting diode. Illuminates to indicate that LEVELING OFF pushbutton has been depressed, or that the setting of the POWER control is too high when the LEVELING INT or LEVELING EXT pushbutton is depressed; the indicator will illuminate when the external leveler is disconnected or functioning abnormally in LEVELING EXT.
3	RF OUT Connector	Precision Type N Connector. The RF output of the plug-in is fed to this point; output impedance is 50 Ω.
4	EXT DET Connector	BNC connector. The external detector signal is fed in through this connector.
5	Locking Screw	Knurled knob. Used to lock RF plug-in in place in mainframe.

NOTE: This knob must be tightened to ensure low noise and proper seating of the interface connector.

6	LEVELING Switches	Black pushbutton switches; interlocked. Select mode of amplifier leveling employed:
	INT Position	Units with Option M2 include internal power leveling; when the LEVELER switch is set to INT, the RF output is leveled at the RF OUT connector of these plug-ins without the use of an external detector. Plug-ins without internal leveling do not operate properly when the switch is set to INT: there is no control of power level with the RF LEVEL control; the output is either fully on or fully off.

2.3 REPACKAGING FOR SHIPMENT

If the instrument is to be packaged for re-shipment, use the original shipping container and packaging. If the original packaging has been discarded or is not in condition for re-use, perform the following packaging procedure:

a. Wrap the instrument in a heavy paper wrapping or plastic protective covering.

b. Place a protective cushion in the bottom of the shipping carton and place the instrument on the cushion.

c. Surround the remaining sides and top with additional protection cushions to provide support for the instrument without resting it on the controls or connectors.

2.4 SHIPPING METHOD

This instrument should be shipped only by truck freight, rail freight, air freight, or parcel delivery service. If it is shipped by parcel post, damage is likely to occur. Kruse Electronics is not responsible for units damaged in shipment to the factory for repair, whether such units are in warranty or not.

2.5 INSURANCE

Insure the unit for full value whenever it is shipped.

2.6 RETURNS FOR REPAIR

Be sure to fully identify any instrument that is returned to Kruse Electronics for repair of any kind, in-warranty or not. The paperwork with the unit must show the instrument serial number, malfunction or problem to be corrected, and the exact address to which the instrument should be returned when repairs are completed.

SECTION 2

INITIAL INSTRUCTIONS

2.1 UNPACKING AND INSPECTION

The instrument is shipped in a specially constructed container to provide maximum protection to the equipment during transit. Use care when unpacking to prevent damage to the equipment, such as cabinet finish, controls, indicators, connectors, etc.

2.1.1 Removing Contents. To remove the instrument from the shipping container, cut and fold back outer carton top flaps, remove top protective cushion, lift instrument clear of shipping container, open dust protection bag and remove equipment.

2.1.2 Inspection. The instrument was carefully tested and inspected prior to shipment. Inspect the instrument for damage incurred during shipment. If the instrument is damaged in any way, see the warranty and repair notices at the front of this manual.

2.2 PREPARATION FOR USE

Each RF plug-in is supplied with a metal dial drum for frequency readout in the 540 sweeper:

a. Insert the RF plug-in into the rectangular hole at the right-hand side of the 540.

b. Lock the plug-in in place by turning the small knob at the bottom CW.

c. If necessary, install a new dial drum in the 540, following steps d through g.

d. Remove the top cover of the instrument; it is held in place with two screws.

e. Face the instrument, holding the dial scale drum with its gear to the left, and the smooth rounded end knob to the right.

f. Push the smooth knob into its mating receptacle near the plug-in compartment shield. The spring will give way, allowing you to lower the left side of the drum.

g. Snap the drum into place and align the locating key with the mating groove in the left side of the drum assembly.

Power Output Control:	Front panel control provides > 30 dB of unleveled power control and > 6 dB of leveled power control.
Leveled-Unleveled Control:	Front panel switch selects either externally leveled or unleveled operation.
External Detector Input:	Rear panel BNC connector, input sensitivity approx. -10 mV/mW of leveled output power.
Phase-Lock Input:	Rear panel BNC connector. Sensitivity is approx. 15 MHz/Volt. Controlled 6 dB/octave roll-off from 2 to 500 KHz.
RF Output:	Rear panel precision stainless Type "N" female connector.

1/17/73

MODEL 570-15002
OSCILLATOR PLUG-IN
8.5 - 10.5 GHz

SPECIFICATIONS

When operated in Model 540 Sweeper

Frequency Range:	Rated 8.5 - 10.5 GHz Useable 8.45 - 10.55 GHz
Power Output: (into 50 ohms)	7 mW min.
Power Variation:	Unleveled, ±0.5 dB Leveled, ±0.05 dB plus external power sampler error
Frequency Accuracy:	±0.5% of indicated value at +25° C
Spurious Signals:	Harmonic, 20 dB below max. output Non-Harmonic (> 1MHz from F_o), 60 dB below max. output
Residual AM Index @ Max. Output:	-46 dB Unleveled -40 dB Leveled
Residual FM, 1 Hz to 30 KHz:	CW Mode, 20 KHz peak Sweep Mode, 40 KHz peak
Frequency Stability, % of F_o:	
Temperature Change	±0.05%/° C
Load VSWR 1:1 to 3:1, any phase	±0.5%
6 dB RF Power Change	±0.25%
10% Line Voltage Change	±0.001%
△F Sweep Range:	±105 MHz
Temperature Range:	Operating 0° to +55° C Ambient Non-Operating -55 to +85° C
Unleveled Indicator:	Front panel lamp lights when output power is unleveled.

1/17/73

1.4 ACCESSORIES

The accessories listed below may be ordered separately:

1.4.1 Leveling Cable Model 9105. A 24-inch cable with a male Type BNC connector on one end and a Sealectro connector on the other, this accessory is used with some Kruse external samplers.

1.4.2 Coaxial Adapter Model 9132. This unit is a Type N female to 3 mm (SMA) male connector adapter.

1.4.3 Coaxial Adapter Model 9137. This unit is a Type N male to 7 mm precision (APC-7) sexless connector adapter.

1.4.4 Model 593 Flexible Plug-in Extension. 570 series RF Plug-ins may be operated outside the 540 mainframe using this three-foot extension cable; access to the plug-in for maintenance or calibration is otherwise severely limited.

1.5 SPECIFICATIONS

Operating specifications for the 570-15200 are listed on the following page.

SECTION 1

INTRODUCTION AND DESCRIPTION

1.1 SCOPE OF MANUAL

These preliminary instructions are supplied to provide operating information, specifications, parts lists, and schematic diagrams for the 570-15200 RF plug-in. Permanent instruction manuals, when available, will include application information, operating instructions, theory of operation, and maintenance instructions.

A permanent manual will be sent to replace this interim manual upon written request; such request must include the model number and serial number of the plug-in and the complete address to which the manual should be sent.

1.2 DESCRIPTION

Model 570 series RF plug-ins are used in the Kruse Model 540 Multiband Sweeper; the 570-15200 is a 3 mW unit operating in the 7 to 11 GHz band. The unit may be leveled internally (M2 option) or externally, or operated unleveled.

The RF plug-in is an all solid-state (no BWO's) fundamental-frequency generator (no frequency multipliers or BFO's).

Major subassemblies of the RF plug-in include the single AM board, which contains all amplitude modulation circuits including the leveling circuits, a plug-in YIG driver board which shapes the frequency-controlling voltages, an oscillator module which generates the RF signal, and a modulator module which contains the amplitude-controlling PIN diode.

1.3 OPTIONS

Optional configurations of the Model 570 RF plug-in can be constructed to meet special requirements of power, frequency coverage, etc. Contact the factory for details. Two options are currently available:

1.3.1 Option M2, Internal Leveling. Option M2 adds an internal directional sampler for power leveling. Output flatness is ±1.0 dB maximum at the rated output.

1.3.2 Option M26, Rear Connectors. The RF output connector is moved from the front to the rear panel. A BNC connector is added to the rear for external leveling detector input.

INSPECTION CHARGES

Nominal inspection charges will be levied if a unit returned for warranty repairs shows no evidence of malfunction or if it operates within its published specifications.

FREIGHT CHARGES

Instruments returned for warranty repair must be sent with *all freight charges prepaid* to the factory in Sunnyvale, California or to the local Systron-Donner service center in your area. After repair, instruments will be returned from the factory or local service center with "collect" freight charges, or freight costs will be billed later.

If air freight or other premium shipment method is desired, please notify the factory or the local service center in advance so arrangements can be made.

SYSTRON DONNER SERVICE CENTERS

Eleven customer service centers are in operation throughout the United States, Europe, and The Pacific. It may be to your advantage to use these local centers for warranty repair, non-warranty repair, or calibration services. If no service center is listed for your area, call the local SCIENTIFIC DEVICES Office for information.

NEW ENGLAND

Systron Donner Service Center
580 Moody Street
Waltham, Massachusetts 02154
Telephone (617) 894-0559

EAST COAST

Systron Donner Service Center
71 Grand Avenue
Palisades Park, New Jersey 07650
Telephone (201) 945-4500

WASHINGTON, D.C. AREA

Systron Donner Service Center
6615 Backlick Road
Springfield, Virginia 22150
Telephone (703) 451-6500

MIDWEST

Systron Donner Service Center
2720 Des Plaines Avenue
Des Plaines, Illinois 60018
Telephone (312) 297-5240

SOUTHWEST

Systron Donner Service Center
312 North Central Expressway
Richardson, Texas 75080
Telephone (214) 231-8106

NORTHERN CALIFORNIA

Systron Donner Service Center
655 West Evelyn Avenue
Mountain View, California 94041
Telephone (415) 964-4230

SOUTHERN CALIFORNIA

Systron Donner Service Center
3662 Katella Avenue, Suite 105
Los Alamitos, California 90720
Telephone (213) 596-1684

UNITED KINGDOM

Systron-Donner, Ltd.
St. Mary's Road
Sydenham Industrial Estate
Leamington Spa, Warwickshire, England
Telephone Leamington Spa (0926) 35411

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Systron-Donner S. A.
24 rue de Paris
78560 Le Port Marly
Telephone 958. 48-63 (lignes groupées)

GERMANY

Systron-Donner GmbH
Bodensee Strasse 113
D-8000 Munich 60
Telephone (089) 8 71 10 21

AUSTRALIA

Systron-Donner Pty. Ltd.
2 Vautier Street
Elwood, Victoria 3184
Telephone 91 2223

SYSTRON DONNER

WARRANTY AND REPAIR

Issued 1 January 1974

SHIPMENT DAMAGE

The instrument described in this manual should be tested as soon as it is received. If it fails to operate properly or is damaged in any way, a claim must be filed with the carrier. Have carrier agent inspect damage to instrument and packing crate and forward us a copy of his written report. You will then be advised of replacement or repair arrangements and disposition of the equipment. Please *include model number and serial number* when referring to this instrument for any reason.

WARRANTY

Systron-Donner (Sunnyvale) products are warranted against defects in workmanship and materials. This warranty is limited to repair or replacement of products or parts which prove defective in normal service after delivery to original purchaser. The warranty period is two years for all instruments and parts manufactured at the Sunnyvale, California plant of Systron-Donner Corporation. The warranty period on cathode ray tubes and YIG-tuned oscillators, built by other manufacturers, is limited to one year. Although Systron-Donner endeavors to purchase the finest quality parts available, the warranty from the manufacturer on these major components is one year.

Beyond the "shipment damage" provisions, no warranty attaches to the detection element used in Model 4020 Digital Power Meter power heads. Failures of this element are usually caused by excessive input power or by physical shock (dropping the power head), neither of which can be covered by warranty.

If any fault develops:

1. Notify the local service center or the factory, giving *full details* of the difficulty, *including the model number and serial number*. Upon receipt of this information, you will be sent service or shipping instructions.
2. Upon receipt of shipping instructions, forward the instrument prepaid and insured, and repairs will be made at the service center or factory. If requested, an estimate will be made before the work begins when the instrument is not covered by this warranty.

Systron-Donner Corporation is not responsible for consequential damage or loss of data in the event of equipment failure.

PACKING

The instrument described in this manual should be packed in the original carton. If original carton is unusable or not available, use a heavy cardboard box with approximately three inches of foam or other shock-absorbing material surrounding the instrument. If desired, packing services of a local transfer and storage company may be employed. Specific packing instructions are given in Section 2 of most instruction manuals.

SHIPPING METHOD

The instrument described in this manual should only be shipped by truck freight, rail freight, air freight, or parcel delivery service. *If it is shipped by parcel post, damage is likely to occur.* Systron-Donner is not responsible for units damaged in shipment to the service center or factory for repair, whether such units are in warranty or not.

INSURANCE

For your own protection, insure the unit for full value whenever it is shipped.

SYSTRON-DONNER CORPORATION – SUNNYVALE INSTRUMENTS GROUP
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Kruse Electronics

PRELIMINARY INSTRUCTION MANUAL

MODEL 570-15200

RF PLUG-IN

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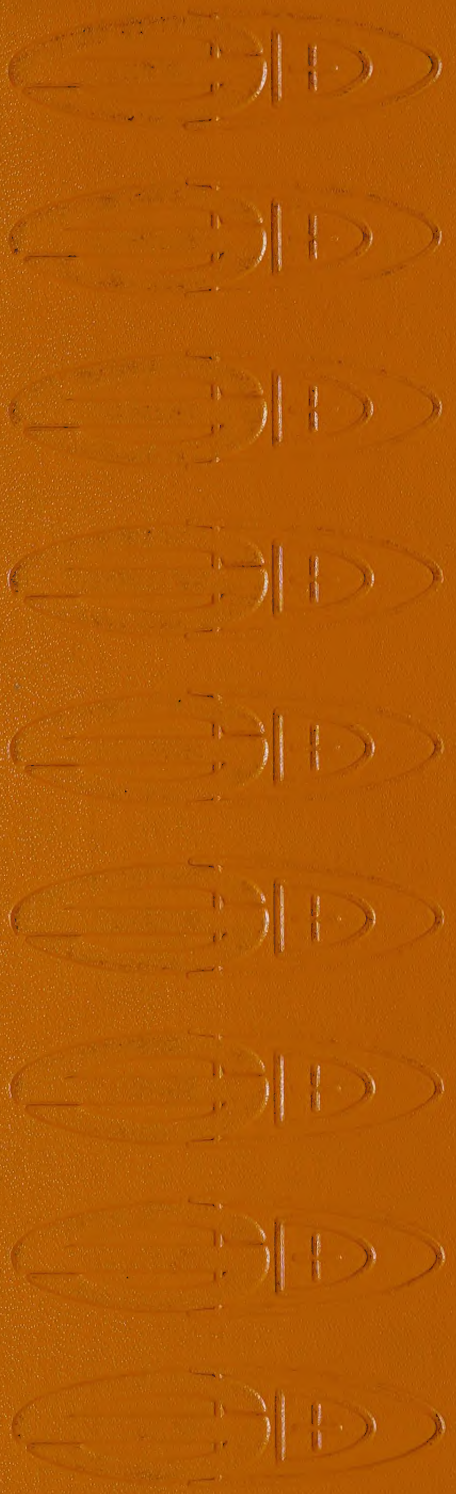

MODEL 570-15200

RF PLUG-IN

SYSTRON DONNER